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Patent claims

1. Method of communicating consecutive frames (Bn, Bn+1) of digital data comprising,

mapping payload data into complex symbols, interspersing appropriate pilot symbols, mapping symbols on respective sub-channels, whereby

the insertion of a given pilot configuration (PC) into the stream of payload data will give rise to a specific output signal being associated with a given PAPR value, wherein

the digital data comprises OFDM modulated signals comprising a first plurality of payload (PL) carrying sub-channels and a second plurality of pilot carrying sub channels (P1, P2, P3, P4), whereby

each individual frame of (Bn, Bn+1) of payload data to be transmitted over the payload channels is associated with a given unique pilot configuration (PC) chosen from a sub-set (00 – 11, 001 - 101) of predetermined pilot configurations, each pilot configuration (PC) forming a unique pattern of predetermined pilot symbols (-1, 1), and transmitted, whereby

prior to the transmission of at least oné given frame (Bn, Bn+1) of payload data (PL), each pilot configuration (PC) of the sub-set is evaluated with regard to PAPR for the associated frame of payload data (PL), whereby the pilot configuration (PC) being associated with the lowest PAPR value is being chosen for transmission.

2. Method according to claim 1, whereby the plurality of pilot configurations (PC) represent block codes allowing error correction at the receiver.

3. Method according to claim 1, whereby a control word (id+) indicative of the pilot configuration (PC) associated with a subsequent frame (Bn+1) or a particular frame of a subsequent given order number is inserted into the frame (Bn) and coded on a predetermined payload channel.

4. Method according to claim 3, wherein for every n-1 frame (Bn, Bn+1) in a frame period (FP), the complete frame (Bn, Bn+1) comprising both payload data (PL) and the control word (id+) and pilot configuration (PC) is optimised with regard to PAPR.

5. Method according to claim 4, wherein every n frame in a frame period (FP) is not optimised with regard to PAPR.

6. Method according to any previous claim wherein, the sub-carriers (P1 – P4) carrying the pilot signals are digitally modulated at a lower order (BPSK) than sub-carriers (PL) carrying the payload data (QAM).

7. Method according to claim 2 wherein the block code forming pilot configurations (PC) have a hamming distance of ≥3.

8. Method according to any previous claim wherein the sub-channels are modulated by BPSK or n-QAM modulation.

9. Transmitter comprising

a mapping stage (2), mapping payload data on a subset of a plurality of frequency orthogonal sub-carriers

a plurality of parallel-coupled pilot insertion stages (3_1 – 3_2) coupled to the mapping stage, each pilot insertion stage inserting a unique pilot configuration on at least another subset of sub-carriers,

a respective inverse fast Fourier transmission stage (4_1 – 4_n) processing signals from each respective pilot insertion stage (3_1 – 3_n),

a PAPR measuring and pilot decision stage (13), measuring and evaluating PAPR for each unique pilot configuration whereby

each individual frame of (Bn, Bn+1) of payload data to be transmitted over the payload channels is associated with a given unique pilot configuration (PC) chosen from a sub-set (00 – 11, 001 - 101) of predetermined pilot configurations, each pilot configuration (PC) forming a unique pattern of predetermined pilot symbols (-1, 1), and transmitted, whereby

prior to the transmission of at least one given frame (Bn, Bn+1) of payload data (PL), each pilot configuration (PC) of the sub-set is evaluated with regard to PAPR for the associated frame of payload data (PL), whereby the pilot configuration (PC) being associated with the lowest PAPR value is being chosen for transmission.

10. Transmitter according to claim 9, wherein each unique pilot configuration (PC) has a hamming distance of at least three to any other pilot configuration (PC).

11. Transmitter according to claim 9, moreover comprising a control word insertion stage (11), inserting a control word (id+) in a transmitted frame (Bn), the control word (id+) being indicative of the pilot configuration used in a frame (Bn+1) of any given subsequent order number.

12. Receiver comprising a fast Fourier transform stage (17) for transforming baseband signals into to frequency signals relating to individual sub-channels (P1 – P4, PL), and

demodulation stage (18) for performing individual demodulation, such as n-QAM, of the frequency signals into bit estimates,

the receiver furthermore comprising a pilot extraction stage (23) for extracting block coded pilot signals into assumed pilot configurations,

the assumed pilot configuration (PC) being provided to a frequency estimator (22) for adjusting the fast Fourier transform stage (17) and to a channel estimator (21) for adjusting the demodulating stage (18).

13. Receiver comprising a fast Fourier transform stage (17) for transforming baseband signals into to frequency signals relating to individual sub-channels and a

demodulation stage (18) for performing individual demodulation, such as n-QAM, of the frequency signals into bit estimates,

the receiver furthermore comprising a control word extraction stage (24) for extracting a control word (id+) of any subsequent order into an assumed pilot configuration (PC),

the assumed pilot configuration (PC) being provided to a frequency estimator (22) for adjusting the fast Fourier transform stage and to a channel estimator for adjusting the demodulating stage (18).